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JASPER Article

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A JASPER fact sheet

JASPER stands for Joint Actinide Shock Physics Experimental Research

It is located in Area 27 at the NNSS.

It houses a two-stage light-gas gun, using up to 3.5 kg gun powder in the first stage; the second stage uses hydrogen, helium, or nitrogen drive gasses to accelerate 28mm diameter, \approx 25 g mass projectiles to reach launch velocities between 1.8-7.6 km/s.

(7.6 km/s \approx 17000 mph)

The facility is operated by NSTec, and LLNS leads the scientific program, target design, fabrication, and engineering.

Project started in 1996

First shot: 2001

First Pu shot: 2003

Total shots to date: 127

Total Actinide experiments: 56

The samples we compress are about the same size as a dime, but machined and hand-lapped to a flatness of $< 2.5 \mu\text{m}$, 1/40 the thickness of a sheet of paper.

A typical experiment lasts about 300 nanoseconds, in which time we determine the final pressure and density to better than 0.5%

We use a variety of diagnostics: shorting pins, x-rays, velocimetry (VISAR and PDV), radiometry (measures light emitted from the target)

Gathering Data on Multiple Platforms is Essential for Understanding Weapons Material Behavior

